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certify that I am conversant in the Japanese and English
languages and that the attached translation is a true and
accurate translation of a certified copy of Japanese Patent
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A handwritten signature in cursive script, appearing to read "Yoshito Fukushima".

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[Document Name] Specification

[Title of the Invention] Roll of packaging material,
packaging machine using the roll of packaging material and
product handling system comprising the packaging machine

5 [Scope of Claim for Patent]

[Claim 1] A roll of packaging material around which
a strip of packaging material for use in packaging a product
is wound, characterized by comprising

first storage means for readably storing a packaging
10 condition for packaging the product using the roll of
packaging material.

[Claim 2] The roll of packaging material as recited
in claim 1, characterized in that said first storage means
further stores information related to a material of the roll
15 of packaging material.

[Claim 3] The roll of packaging material as recited
in claim 1 or 2, characterized in that said first storage
means further stores information related to the fabrication
of the roll of packaging material.

20 [Claim 4] A roll of packaging material around which
a strip of packaging material for use in packaging a product
is wound, characterized by comprising

first storage means for readably storing a packaging
material roll identifier for identifying the roll of
25 packaging material.

[Claim 5] A roll of packaging material around which a strip of packaging material for use in packaging a product is wound, characterized by comprising

first storage means for readably storing a product
5 identifier for identifying the product to be packaged.

[Claim 6] The roll of packaging material as recited in any of claims 1 to 5, characterized in that said first storage means is non-contact storage means readable in a non-contact fashion.

10 [Claim 7] The roll of packaging material as recited in any of claims 1 to 5, characterized in that said first storage means is contact storage means readable in a contact fashion.

[Claim 8] A packaging machine for packaging a product
15 using a roll of packaging material comprising first storage means for readably storing a packaging condition for packaging the product, characterized by comprising:

reading means for reading the packaging condition stored in said first storage means of said roll of packaging
20 material; and

packaging means for packaging the product according to the packaging condition read by said reading means.

[Claim 9] A packaging machine for packaging a product using a roll of packaging material comprising first storage
25 means for readably storing a packaging material roll

identifier for identifying the roll of packaging material,
characterized by comprising:

second storage means for storing beforehand a
packaging condition for each packaging material roll
5 identifier;

reading means for reading the packaging material roll
identifier stored in said first storage means of said roll
of packaging material; and

packaging means for selecting the packaging condition
10 stored beforehand in said second storage means corresponding
to the packaging material roll identifier read by said
reading means to package the product.

[Claim 10] A packaging machine for packaging a product
using a roll of packaging material comprising first storage
15 means for readably storing a product identifier for
identifying a product to be packaged, characterized by
comprising:

second storage means for storing beforehand a
packaging condition for each product identifier;

20 reading means for reading the product identifier
stored in said first storage means of said roll of packaging
material; and

packaging means for selecting the packaging condition
stored beforehand in said second storage means corresponding
25 to the product identifier read by said reading means to

package the product.

[Claim 11] The packaging machine as recited in any of claims 8 to 10, characterized in that said reading means is non-contact reading means capable of reading contents of
5 said first storage means in a non-contact fashion.

[Claim 12] The packaging machine as recited in any of claims 8 to 10, characterized in that said reading means is contact reading means capable of reading the contents of said first storage means in a contact fashion.

10 [Claim 13] A product handling system, characterized by comprising:

the packaging machine as recited in claim 10;

a handling device that operates together with said packaging machine to handle a product;

15 operating condition recording means for associating beforehand product identifiers for identifying a product with operating conditions of said handling device for recording; and

communication means for selecting an operating
20 condition recorded in said first storage means corresponding to the product identifier read by said reading means to supply the selected operating condition to said handling device, wherein

said handling device operates based on the operating
25 condition supplied from said communication means.

[Claim 14] The product handling system as recited in claim 13, characterized in that said handling device supplies said packaging machine with a history of operations based on said operating condition as history information, and

5 said packaging machine makes said first storage means store said history information.

[Detailed Description of the Invention]

[0001]

[Technical Field to which the Invention Belongs]

10 The present invention relates to a roll of packaging material mainly for use in packaging a product to be mass produced, a packaging machine that performs packaging using the roll of packaging material, and a product handling system comprising the packaging machine.

15 [0002]

[Conventional Art]

A bag forming and packaging machine is conventionally a sanitary and labor-saving machine without requiring much human effort in handling packaging material. There are two
20 types for this bag forming and packaging machine, i.e., a horizontal pillow type bag forming and packaging machine and a vertical pillow type bag forming and packaging machine.

[0003]

As for the horizontal pillow type bag forming and
25 packaging machine, pieces to be packaged are horizontally

supplied into the machine, and pillow type (pillow-shaped) bags are horizontally produced, while the supplied pieces to be packaged are packaged into the bags.

[0004]

5 As for the vertical pillow type bag forming and packaging machine, on the other hand, pieces to be packaged are vertically supplied by means of gravity, and pillow type (pillow-shaped) bags are vertically produced, while the supplied pieces to be packaged are packaged into the bags.

10 [0005]

 The horizontal and vertical pillow type bag forming and packaging machines, being capable of producing bags with a film roll wound with a film of long length while successively packaging pieces to be packaged (products), are
15 mainly used for products to be mass produced.

[0006]

[Problems to Be Solved by the Invention]

 In recent years, however, enterprises and the like manufacturing the products are demanding a speed increase in
20 the bag forming and packaging machine for improved productivity, along with shortened downtime during which the manufacture of products is stopped. In other words, for the purpose of improving the total productivity, the enterprises wish for further improvement in productivity, not merely by
25 increasing the speed of the bag forming and packaging machine

but also by shortening the downtime during which the product manufacture is always stopped for a given condition.

[0007]

The downtime in the bag forming and packaging machine occurs, for example, during an exchange of film rolls, the packaging material, or setting of packaging conditions. More specifically, in order to exchange film rolls, the operator mounts a new film roll in the bag forming and packaging machine, brings the machine into actual operation, and finds out optimum packaging conditions. Then, the operator manually inputs the found packaging conditions to the bag forming and packaging machine to make advance registration. After that, the operator operates the bag forming and packaging machine to manufacture products according to the registered packaging conditions.

[0008]

In this manner, the conventional bag forming and packaging machine requires a great deal of time in exchanging film rolls and setting packaging conditions. Moreover, the loss of films used for finding out optimum conditions in exchanging film rolls and setting packaging conditions greatly depend on the skill of the operator: in the case of an unskilled operator, additional loss of time and film loss are produced if he finds out erroneous packaging conditions.

[0009]

In addition to shortened downtime, the enterprises desire to know the result of a total production increase in real time for clearly establishing guidelines for the next production.

5 [0010]

A product handling system using the conventional bag forming and packaging machine, however, does not allow them to know the production result in real time. For example, with the conventional product handling system, the operator
10 writes down in a daily report or the like the number of products (packaging number) he produced by operating the bag forming and packaging machine, number of defective pieces, operating time and the like. For this reason, problems such as delay in communicating the production result and errors
15 in the written information are occurring.

[0011]

An object of the present invention is to provide a roll of packaging material with which the shortening of downtime is easily achieved, and real-time production management can
20 be made, and to provide a packaging machine using such a roll of packaging material and a product handling system using such a packaging machine.

[0012]

[Means for Solving the Problems]

25 (First Invention)

A roll of packaging material according to the present invention is a roll of packaging material around which a strip of packaging material for use in packaging a product is wound, comprising first storage means for readably storing a packaging condition for packaging the product using the roll of packaging product.

[0013]

In the roll of packaging material according to a first invention, the packaging condition for packaging the product using the roll of packaging material is readably stored by the first storage means.

[0014]

In this case, since the packaging condition is stored in the first storage means affixed to the roll of packaging material, an optimum packaging condition can be set in a short time at the time of exchange of rolls of packaging material, regardless of the operator's skill. This prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[0015]

(Second Invention)

A roll of packaging material according to a second invention is configured, in the structure of the roll of packaging material according to the first invention, such

that the first storage means further stores information related to a material for the roll of packaging material.

[0016]

In this case, since the information related to the material is further stored in the first storage means affixed to the roll of packaging material, the details of packaging conditions can be set based on the material-related information.

[0017]

10 (Third Invention)

A roll of packaging material according to a third invention is configured, in the structure of the roll of packaging material according to the first or second invention, such that the first storage means further stores information related to the fabrication of the roll of packaging material.

[0018]

In this case, since the first storage means further stores information related to the fabrication of the storage means affixed to the roll of packaging material, the details of packaging conditions can be set based on the fabrication-related information.

[0019]

(Fourth Invention)

25 A roll of packaging material according to a fourth

invention is a roll of packaging material around which a strip of packaging material for use in packaging a product is wound, comprising first storage means for readably storing a packaging material roll identifier for identifying the roll of packaging material.

[0020]

In the roll of packaging material according to the fourth invention, the packaging material roll identifier for identifying the roll of packaging material is readably stored by the first storage means.

[0021]

In this case, since the packaging material roll identifier is stored in the first storage means affixed to the roll of packaging material, the roll of packaging material can be identified by the packaging material roll identifier at the time of exchange of rolls of packaging material. Accordingly, a packaging condition can be set based on the packaging material roll identifier. Thus, an optimum packaging condition can be set in a short time regardless of the operator's skill. This prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[0022]

25 (Fifth Invention)

A roll of packaging material according to a fifth invention is a roll of packaging material around which a strip of packaging material for use in packaging a product is wound, comprising first storage means for readably storing a product
5 identifier for identifying a product to be packaged.

[0023]

In the roll of packaging material according to the fifth invention, the product identifier for identifying the product to be packaged is readably stored by the first storage
10 means.

[0024]

In this case, since the product identifier is stored in the first storage means affixed to the roll of packaging material, the product to be packaged can be identified by the
15 product identifier at the time of exchange of rolls of packaging material. Accordingly, a packaging condition can be set based on the product identifier. Thus, an optimum packaging condition can be set in a short time regardless of the operator's skill. This prevents even an unskilled
20 operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[0025]

(Sixth Invention)

A roll of packaging material according to a sixth
25 invention is configured, in the structure of the roll of

packaging material according to any of the first to fifth inventions, such that the first storage means is non-contact storage means readable in a non-contact fashion.

[0026]

5 In this case, the packaging condition is readably stored in the non-contact fashion in the first storage means by the non-contact storage means. This makes it possible to easily read the packaging condition without contacting the first storage means of the roll of packaging material.

10 [0027]

(Seventh Invention)

A roll of packaging material according to a seventh invention is configured, in the structure of the roll of packaging material according to any of the first to fifth
15 inventions, such that the first storage means is contact storage means readable in a contact fashion.

[0028]

In this case, the packaging condition is readably stored in the contact fashion in the first storage means by
20 the contact storage means. This makes it possible to reliably read the packaging condition by contacting the first storage means of the roll of packaging material.

[0029]

(Eighth Invention)

25 A packaging machine according to an eighth invention

is a packaging machine that packages a product using a roll of packaging material that includes first storage means for readably storing a packaging condition for packaging the product, comprising: reading means for reading the packaging
5 condition stored in the first storage means of the roll of packaging material; and packaging means for packaging the product based on the packaging condition read by the reading means.

[0030]

10 In the packaging machine according to the eighth invention, the packaging condition stored in the first storage means of the roll of packaging material is read by the reading means, and the product is packaged by the packaging means based on the read packaging condition.

15 [0031]

In this case, since the packaging condition stored in the first storage means affixed for each roll of packaging material is read by the reading means, an optimum packaging condition can be set in a short time regardless of the
20 operator's skill. This prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[0032]

(Ninth Invention)

25 A packaging machine according to a ninth invention is

a packaging machine that packages a product using a roll of packaging material that includes first storage means for readably storing a packaging material roll identifier for identifying the roll of packaging material, comprising:
5 second storage means for storing beforehand a packaging condition for each packaging material roll identifier; reading means for reading the packaging material roll identifier stored in the first storage means of the roll of packaging material; and packaging means for selecting the
10 packaging condition stored beforehand in the second storage means corresponding to the packaging material roll identifier read by the reading means to package the product.
[0033]

In the packaging machine according to the ninth
15 invention, the packaging condition is stored beforehand for each packaging material roll identifier by the second storage means. The packaging material roll identifier stored in the first storage means of the roll of packaging material is read by the reading means, and the packaging condition stored
20 beforehand in the second storage means is selected corresponding to the read packaging material roll identifier, so that the product is packaged by the packaging means.

[0034]

25 In this case, since the packaging material roll

identifier stored in the first storage means affixed for each roll of packaging material is read by the reading means, an optimum packaging condition stored beforehand in the second storage means can be set in a short time corresponding to the
5 packaging material roll identifier, regardless of the operator's skill. This prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.
[0035]

10 (Tenth Invention)

A packaging machine according to a tenth invention is a packaging machine that packages a product using a roll of packaging material that includes first storage means for readably storing a product identifier for identifying a
15 product to be packaged, comprising: second storage means for storing beforehand a packaging condition for each product identifier; reading means for reading the product identifier stored in the first storage means of the roll of packaging material; and packaging means for selecting the packaging
20 condition stored beforehand in the second storage means corresponding to the product identifier read by the reading means to package the product.

[0036]

In the packaging machine according to the tenth
25 invention, a packaging condition is stored beforehand for

each product identifier by the second storage means. The product identifier stored in the first storage means of the roll of packaging material is read by the reading means, and the packaging condition stored beforehand in the second
5 storage means is selected corresponding to the read product identifier, so that the product is packaged by the packaging means.

[0037]

In this case, since the product identifier stored in
10 the first storage means affixed for each roll of packaging material is read by the reading means, an optimum packaging condition stored beforehand in the second storage means can be set in a short time corresponding to the product identifier, regardless of the operator's skill. This
15 prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[0038]

(Eleventh Invention)

20 A packaging machine according to an eleventh invention is configured, in the structure of the packaging machine according to any of the eighth to tenth inventions, such that the reading means is non-contact reading means capable of reading contents of the first storage means in a non-contact
25 fashion.

[0039]

In this case, the reading means can easily read the contents of the first storage means in a non-contact fashion.

[0040]

5 (Twelfth Invention)

A packaging machine according to a twelfth invention is configured, in the structure of the packaging machine according to any of the eighth to tenth inventions, such that the reading means is contact reading means capable of reading
10 the contents of the first storage means in a contact fashion.

[0041]

In this case, the reading means can reliably read the contents of the first storage means in a contact fashion.

[0042]

15 (Thirteenth Invention)

A product handling system according to a thirteenth invention comprises: the packaging machine as recited in claim 10; a handling device that operates together with the packaging machine to handle a product; operating condition
20 recording means for associating beforehand product identifiers for identifying a product with operating conditions of the handling device for recording; and communication means for selecting an operating condition recorded in the first storage means corresponding to the
25 product identifier read by the reading means to supply the

selected operating condition to the handling device, wherein the handling device operates based on the operating condition supplied from the communication means.

[0043]

5 In the product handling system according to the thirteenth invention, the product is handled by the handling device together with the packaging machine, the product identifiers for identifying the product and the operating conditions of the handling device are associated beforehand
10 with each other and are then recorded by the operating condition recording means, the operating condition recorded in the first storage means is selected corresponding to the product identifier read by the reading means, and the selected operating condition is supplied to the handling
15 device by the communication means. Then the handling device operates based on the operating condition supplied from the communication means.

[0044]

 In this case, the operator does not need to input a
20 setting condition to the handling device that handles the product by operating together with the packaging machine. This prevents wasteful time loss due to an erroneous setting condition and the like made by the operator.

[0045]

25 (Fourteenth Invention)

A product handling system according to a fourteenth invention is configured, in the structure of the product handling system according to the thirteenth invention, such that the handling device supplies the packaging machine with
5 a history of operations based on the operating condition as history information, and the packaging machine makes the first storage means store the history information.

[0046]

In this case, the handling device supplies the
10 packaging machine with a history of operations based on the operating condition as the history information, and the packaging machine makes the first storage means store the history information. This enables the manager to grasp in real time the history information, such as the number of
15 products (packaging number) he produced by operating the packaging machine, number of defective pieces, and operating time, and also to make plans for improving productivity, and easily pursue the causes of troubles.

[0047]

20 The manager can also prevent problems such as delay in communicating the production result or errors in recited information.

[0048]

[Embodiments of the Invention]

25 Description will, hereinafter, be made of a film roll

as an example of a roll of packaging material according to the present invention, a bag forming and packaging machine using the film roll, and a product handling system comprising the bag forming and packaging machine.

5 [0049]

Fig. 1 is a schematic diagram of a product handling system comprising a bag forming and packaging machine according to an embodiment of the present invention, and Fig. 2 is a block diagram showing an example of the product
10 handling system of Fig. 1.

[0050]

The product handling system shown in Figs. 1 and 2 includes a manufacturing unit 10 for pieces to be packaged, a weighing unit 11, a bag forming and packaging unit 12, an
15 inspector 13, a case packer (cardboard caser) 14, a labeling unit 15, and belt conveyors 16, 17.

[0051]

A film roll 100 is mounted in the bag forming and packaging unit 12. The inspector 13 includes a weight checker
20 13a, a seal checker 13b, a metal detector 13c, and an X-ray inspector 13d.

[0052]

The manufacturing unit 10 manufactures pieces to be packaged (contents of products). The pieces to be packaged
25 manufactured by the manufacturing unit 10 are transported by

the belt conveyor 17 to the weighing unit 11. The transported pieces to be packaged are sorted according to each certain weight by the weighing unit 11. The weighing unit 11 will later be detailed.

5 [0053]

The pieces to be packaged thus sorted are supplied to the bag forming and packaging unit 12. The bag forming and packaging unit 12 produces bags using the mounted film roll 100, and packages the pieces sorted according to each certain weight into the bags. The bag forming and packaging unit 12 will later be described.

[0054]

The pieces packaged in the bags are subsequently transported to the inspector 13. The inspector 13 performs given inspections of the pieces packaged in the bags, with each function of the weight checker 13a, seal checker 13b, metal detector 13c, and X-ray inspector 13d in the inspector 13.

[0055]

20 The weight checker 13a, for example, measures the weight of each bag containing the pieces packaged to inspect if the bag containing the pieces packaged satisfies a given weight, the seal checker 13b inspects if a seal (binding margin) of the bag containing the pieces packaged is completely bonded, the metal detector 13c inspects if any

25

contaminants such as metal pieces are present in the bag containing the pieces packaged, and the X-ray inspector 13d inspects with X-rays if any impurities are included in the bag containing the pieces packaged.

5 [0056]

After the given inspections by the inspector 13, the bags containing the pieces packaged are transported by the belt conveyor 16 to the case packer (cardboard caser) 14. The bags containing the pieces packaged will hereinafter be
10 called the products.

[0057]

A given number of products are stored in each given vessel (for example, cardboard box) with the function of the case packer 14. Vessels storing the products are then
15 transported to the labeling unit 15. The labeling unit 15 affixes a given label to each vessel storing the products. The label recites, for example, where to deliver the products, expiration, and transportation related information. Vessels storing the products are subsequently
20 transported to a delivery step to be delivered to a client according to the information recited on each label.

[0058]

Now refer to Fig. 3 which is an elevation view showing the details of the belt conveyor 17, weighing unit 11, and
25 bag forming and packaging unit 12 of Fig. 1.

[0059]

The weighing unit 11 shown in Fig. 3 is composed of a weighing apparatus 200. The weighing apparatus 200 has a plurality of meters (hereinafter called weighing hoppers) 220, a plurality of combination vessels (hereinafter called combination hoppers) 230, and a collection unit 240.

[0060]

The bag forming and packaging unit 12 shown in Fig. 3, on the other hand, is composed of a vertical pillow type bag forming and packaging apparatus 300. The vertical pillow type bag forming and packaging apparatus 300 has a computer 1 (Fig. 7). The computer 1 will later be detailed.

[0061]

A support shaft 301 in the vertical pillow type bag forming and packaging apparatus 300 carries a film roll 100. The support shaft 301 and the film roll 100 will later be described. The vertical pillow type bag forming and packaging apparatus 300 is supported by a frame 60, and above the vertical pillow type bag forming and packaging apparatus 300 is provided the belt conveyor 17 and the weighing apparatus 200.

[0062]

The pieces to be packaged are initially supplied into the weighing apparatus 200 of the weighing unit 11 by the belt conveyor 17. The weighing apparatus 200 performs combination

weighing of pieces to be packaged with each function of the plurality of weighing hoppers 220 and the plurality of combination hoppers 230 to sort them according to each certain weight. The pieces to be packaged thus sorted are
5 then supplied through the collection unit 240 to a collection chute 22 of the vertical pillow type bag forming and packaging apparatus 300 in the bag forming and packaging unit 12.

[0063]

In the vertical pillow type bag forming and packaging
10 apparatus 300 of the bag forming and packaging unit 12, a film is supplied from the film roll 100 through a plurality of guides 30 to a lower part of the collection chute 22.

[0064]

Now refer to Fig. 4 which is a perspective view showing
15 bag forming and packaging by the vertical pillow type bag forming and packaging apparatus 300.

[0065]

As shown in Fig. 4, the vertical pillow type bag forming and packaging apparatus 300 includes a sailor 17, a
20 cylinder 18, a vertical sealing mechanism (sealing jaw) 19, a pair of pull-down belts 20, a horizontal sealing mechanism (sealing jaw) 21, and a collection chute 22.

[0066]

In the vertical pillow type bag forming and packaging
25 apparatus 300, the film passes through a gap between the

sailor 17 and the cylinder 18 to be formed into a tubular shape. The tubular-formed film is transported by the pair of pull-down belts 20 between the cylinder 18 and the pair of pull-down belts 20 so that both side edges of the film
5 overlapped by the vertical sealing mechanism 19 are vertically bonded. This vertically bonded portion is also called a center seal.

[0067]

The vertically bonded tubular film is then
10 horizontally bonded by the horizontal sealing mechanism 21, and simultaneously, the pieces to be packaged pass through the inside of the collection chute 22 and cylinder 18 to be packaged in the tubular film. Then, the film containing the pieces packaged is transported by the pair of pull-down belts
15 20, horizontally bonded and cut by the horizontal sealing mechanism 21, which results in the production of a bag 25 containing the pieces sealed.

[0068]

Then, Fig. 5 is a diagram showing the details of the
20 support shaft 301 of the vertical pillow type bag forming and packaging apparatus 300 and the film roll 100.

[0069]

Fig. 5 (a) shows a state before the film roll 100 is mounted around the support shaft 301, Fig. 5 (b) shows a cross
25 section of the film roll 100 and the support shaft 301

immediately after the film roll 100 has been mounted around the support shaft 100, and Fig. 5 (c) shows a cross section of the film roll 100 and the support shaft 301 with the film roll of Fig. 5 (b) being held by the support shaft 301.

5 [0070]

First of all, as shown in Fig. 5 (a), a recording medium 110 is affixed to a hollow core of the film roll 100. The recording medium 110 is composed of a data label on which information, which will be described later, is represented by
10 codes such as bar codes. The recorded contents of the recording medium 110 will be detailed later.

[0071]

The support shaft 301 of the vertical pillow type bag forming and packaging apparatus 300 is provided with a
15 rotator 303 capable of rotating independently in a circumferential direction of the support shaft 301. This rotator 303 is provided with a recording medium reading device 302. The support shaft 301 of the vertical pillow type bag forming and packaging apparatus 300 is provided with
20 holders 304 for holding the film roll 100. The recording medium reading device 302 is comprised of an optical reading device that reads information from the recording medium 110.

[0072]

As shown in Fig. 5 (b), the hollow core of the film
25 roll 100 is fitted into the support shaft 301 of the vertical

pillow type bag forming and packaging apparatus 300.

[0073]

Next, as shown in Fig. 5(c), the holder 304 projects outwardly from the support shaft 301 to abut the inside face
5 of the film roll 100, thereby holding the film roll 100.

[0074]

Recorded contents of the recording medium 110 affixed to the inside face of the film roll 100 (hereinafter referred to as data) are subsequently read by the recording medium
10 reading device 302 on the rotator 303 of the support shaft 301. In this case, the recording medium reading device 302 of the rotator 303 reads the data of the recording medium 110 when the rotator 303 rotates in the direction of the arrow X independently of the support shaft 301.

15 [0075]

Alternatively, a magnetic card on which information is magnetically recorded may be used as the recording medium 110. In this case, a magnetic card reader is used as the recording medium reading device 302. Further alternatively,
20 a non-contact tag on which information is recorded by utilizing an electromagnetic wave or a magnetic field may be used as the recording medium 110. In this case, an apparatus that reads the information utilizing the electromagnetic wave or magnetic field from the non-contact tag is used as
25 the recording medium reading device 302.

[0076]

Note that the recording medium 110 is not limited to bar codes and the recording medium reading device 302 is not limited to the above examples, but another arbitrary
5 information recording medium may be used as the recording medium 110, and another arbitrary information recording medium reading device may be used as the recording medium reading device 302. In addition, while it is configured that the recording medium reading device 302 rotates
10 independently of the support shaft 301, data of the recording medium 110 may be read by another arbitrary method not exclusively by the above-described method.

[0077]

Now refer to Fig. 6 which is a schematic diagram
15 showing manufacturing steps of the film roll 100.

Fig. 6 (a) shows manufacturing steps of films themselves of the film roll 100, and Fig. 6 (b) shows steps of fabricating the film manufactured in Fig. 6 (a) under given conditions before conversion.

20 [0078]

Firstly, in the manufacturing steps of films themselves shown in Fig. 6 (a), diverse films are produced according to their materials, compositions, thicknesses, and the like.

25 [0079]

Among the materials of manufactured films are CPP (non-oriented polypropylene film), OPP (bi-oriented polypropylene film), PET (polyethylene terephthalate film), VMPET (aluminum-evaporated polyethylene terephthalate film), and PE (polyethylene film); besides there are various film compositions such as two-layered, three-layered, and five-layered film compositions depending on their use and the like, each of which varies in thickness and the like.

[0080]

Next, a film manufactured in the manufacturing steps of films themselves of Fig. 6 (a) are supplied to the fabrication steps shown in Fig. 6 (b)

[0081]

Firstly, a given print is made on part of the film supplied to Fig. 6 (b), which is to be the surface of a given product. The printed film has anti-ultraviolet films and the like laminated thereon (lamine bonding) for preventing discoloration due to ultraviolet rays and the like. The laminated film is then wound around a paper material called a paper tube for each certain length (a length of 700 to 1000 m, for example).

[0082]

The printed and laminated film is subsequently slit (cut) according to its fabrication procedures and slit conditions.

[0083]

The film normally has a width of approximately 1000 mm, for example, and therefore in the fabrication steps of Fig. 6 (b), it is divided or cut (slit) at each 30 mm as the width for an actual product. In addition, in the fabrication steps, a fabrication condition and the like are recorded in the recording medium 110, and the recorded recording medium 110 is attached on the hollow core of the film roll 100.

[0084]

10 Note that the recording medium 110 may be attached on the hollow core of the film roll 100 beforehand to record a fabrication condition and the like.

[0085]

15 Fig. 7 is a block diagram showing the structure of the computer 1 provided inside the vertical pillow type bag forming and packaging apparatus 300 of the bag forming and packaging unit 12 of Fig. 1.

[0086]

20 The computer 1 includes a CPU (Central Processing Unit) 500, an input/output device 501, a ROM (Read Only Memory) 502, a RAM (Random Access Memory) 503, a recoding medium reading device 302, and an external recording device 506.

[0087]

25 The input/output device 501 transmits and receives

information among other devices. The other devices here include the weighing unit 11 and inspector 13 of the product handling system shown in Fig. 1, weight checker 13a, seal checker 13b, metal detector 13c, X-ray inspector 13d, case
5 packer (cardboard caser) 14, labeling unit 15, belt conveyors 16, 17, and the host computer (not shown) of the product handling system.

[0088]

A system program is stored in the ROM 502. The
10 recording medium reading device 302 reads and writes data to and from the recording medium 110. Parameters related to a bag forming and packaging program are recorded as data in the recording medium 110.

[0089]

15 The external storage device 506, which is composed of a hard disc or the like, stores the bag forming and packaging program along with the parameters related to the bag forming and packaging program read from the recording medium 110. This bag forming and packaging program will later be
20 detailed. The CPU 500 executes the bag forming and packaging program on the RAM 503 using the parameters stored in the external storage device 506. Then, the CPU 500 transmits a production result of the products produced and packaged using the bag forming and packaging program to the host computer
25 (not shown) through the input/output device 501, as will be

described later.

[0090]

Note that the bag forming and packaging program may be downloaded onto the external storage device 506 through
5 a communication medium such as a communication line for execution on the RAM 503.

[0091]

Now refer to Fig. 8 which is a diagram showing an example of the parameters recorded in the recording medium
10 110 of the film roll 100.

[0092]

Fig. 8 (a) shows a product reservation list among the parameters recorded in the recording medium 110, and Fig. 8 (b) shows packaging conditions among the parameters recorded
15 in the recording medium 110.

[0093]

As shown in Fig. 8 (a), the product reservation list recorded in the recording medium 110 includes product identification NO. (product identification number), product
20 name, bag length, bag width, number of products to be produced, film NO. (film number), and the like.

[0094]

As shown in Fig. 8 (b), on the other hand, the packaging conditions recorded in the recording medium 110 include film
25 NO. (film number), film feed, seal time, seal temperature

(not shown), seal pressure (not shown), bag length (not shown), bag width (not shown), material thickness (not shown), manufacturing speed (not shown), product brand (not shown), and fabrication condition.

5 [0095]

In other words, the product reservation list includes all the necessary parameters for the manufacture of given products, and the packaging conditions include all the necessary parameters for the operation of the vertical pillow
10 type bag forming and packaging apparatus 300.

[0096]

An operator takes out packaging conditions for the vertical pillow type bag forming and packaging apparatus 300 using the film roll 100 having a given fabrication condition
15 beforehand, and records the packaging conditions corresponding to each fabrication condition in the recording medium 110 of the film roll 100. The fabrication condition includes film material name, film composition, film
thickness, film manufacturer name, fabrication converter
20 name, fabrication procedures, fabrication line, fabrication time, laminate method, laminate procedures, laminate machine name, laminate time, laminate tension value, laminate
temperature, slit conditions (left end, right end, center, etc.), aging conditions (temperature and time), fabrication
25 manager, inspecting person, used adhesive manufacturer name,

used adhesive grade, bonding speed, bonding drying temperature, amount of applied adhesive, print ink type, presence/absence of special color, presence/absence of a mixture ratio, used ink manufacturer name, used ink grade, 5 product brand, product name, content, film unwinding direction, special fabrication condition, and various barrier properties of oxygen, water vapor, etc.

[0097]

The bag forming and packaging program will 10 subsequently be described. Fig. 9 is a flowchart showing the operation of the computer 1 of the vertical pillow type bag forming and packaging apparatus 300 using the film roll 100 shown in Fig. 8.

[0098]

15 As shown in Fig. 9, the computer 1 initially instructs the support shaft 301 of the vertical pillow type bag forming and packaging apparatus 300 to mount a film roll 100 around the support shaft 301 (Step S11). The operator fits a given film roll 100 into the support shaft 301 of the vertical 20 pillow type bag forming and packaging apparatus 300 according to the instruction from the computer 1.

[0099]

The computer 1 of the vertical pillow type bag forming and packaging apparatus 300 subsequently instructs the 25 recording medium reading device 302 provided in the rotator

303 to read parameters recorded in the recording medium 110 of the film roll 100 (Step S12).

[0100]

The computer 1 extracts a product reservation list and
5 packaging conditions included in the read parameters to make the setting of the vertical pillow type bag forming and packaging apparatus 300 based on the extracted product reservation list and packaging conditions (Step S13).

[0101]

10 The computer 1 of the vertical pillow type bag forming and packaging apparatus 300 in the bag forming and packaging unit 12, subsequently instructs the operator to start the bag forming and packaging operation (Step S14). The operator starts the bag forming and packaging operation according to
15 the instruction.

[0102]

Then, the computer 1 determines whether or not the film of the film roll 100 remains (Step S15). For example, the computer 1 determines whether or not the film of the film roll
20 100 remains, by multiplying the current number of products that have been produced and packaged and the bag width, to compare the initial amount of the film of the film roll 100 and a multiplication result.

[0103]

25 When determining that the film of the film roll 100

have run out, the computer 1 notifies the host computer via the input/output device 501 of Fig. 7 to use another film roll 100 (Step S16), and also returns to Step S11 to repeat the processes of Steps S11 to S15.

5 [0104]

When, on the other hand, determining that the film of the film roll 100 remains, the computer 1 determines whether or not an abnormality is occurring (Step S17). When determining that an abnormality is occurring, the computer
10 1 instructs the operator to perform a given process for the abnormality (Step S18). Then, the computer 1 adds the abnormality information into the recording medium 110 for storage (Step S19).

[0105]

15 When, on the other hand, determining that there is no abnormality, the computer 1 determines whether or not a designated amount of products have been produced (Step S20). Here, the computer 1 compares the number of products to be produced stored in the product reservation list among the
20 parameters related to the bag forming and packaging program and the current number of products that have been produced to determine if the designated amount of products have been produced. When determining that the designated amount of products have not been produced, the computer 1 returns to
25 Step S15 to repeat the processes of Steps S15 to S20.

[0106]

When, on the other hand, determining that the designated amount of products have been produced, the computer 1 finishes the operation.

5 [0107]

As described above, since in this embodiment the packaging conditions are recorded in the recording medium 110 attached on each film roll 100, optimum packaging conditions can be set in a short time at the time of exchange of film
10 rolls 100, regardless of the skill of the operator. This prevents an unskilled operator from setting erroneous packaging conditions and producing additional time loss and film loss.

[0108]

15 Furthermore, in the above product handling system, the number of products produced (packaging number) by the operator operating the bag forming and packaging device, rejected pieces, operating time and the like can be transmitted momentarily to the host computer from the CPU 500
20 via the input/output device 501. As a result, it is possible to prevent delay in communicating the product result or errors in recited information and the like, which enables the manager to know the production result in real time.

[0109]

In this embodiment, the recording medium 110 corresponds to first storage means, the recording medium reading device 302 corresponds to reading means, the vertical pillow type bag forming and packaging apparatus 300 corresponds to packaging means and a packaging machine, the RAM 503 and external recording device 506 correspond to second storage means, the manufacturing unit 10 for pieces to be packaged, weighing unit 11, bag forming and packaging unit 12, inspector 13, case packer 14, labeling unit 15, and belt conveyors 16, 17 correspond to a handling device.

[0110]

In this embodiment, communication among other devices is enabled via the input/output device 501; however, the invention is not limited as such, and a Device Net Connection using other optional devices such as a network controller may be used or a packet communication via the telephone line or the like may be used.

[0111]

In addition, in this embodiment the film roll has been described as an example of a roll of packaging material; however, the invention is not limited as such, and may similarly be applicable to a roll of packaging material wound with other kind of strip of packaging material for use in packaging products.

[0112]

The recording medium 110 may be provided, for example on a roll of packaging material wound with a tape-shaped member called banner (JP 2002-8008 A) as a packaging material. The banner here refers to a tape-shaped member with
5 a print of commercial advertisement or gift coupon thereon, which is attached on the outer surface of a bag.

[0113]

The recording medium 110 may alternatively be provided on a roll of packaging material wound with a chuck tape (JP
10 6-32305 A) as a packaging material. The chuck tape here refers to a pair of strips of tapes integrated in mutual engagement, which is provided on an opening/closing portion of a bag.

[0114]

15 The recording medium 110 may alternatively be provided on a roll of packaging material wound with a strip of tape attached on a notch of a bag so that it can be opened/sealed and re-opened/sealed (JP 11-255205 A), as a packaging material.

20 [0115]

The recording medium 110 may also be provided on a roll of packaging material wound with a display carrier strip to which a plurality of packages are removably attached (JP 9-508879 A), as a packaging material.

25 [0116]

Moreover, in this embodiment, the recording medium 110 is attached on the hollow core of the film roll 100; however, the invention is not limited as such, and the recording medium 110 may be embedded into the hollow core of the film roll 100.

5 [0117]

(Another Example of Bag Forming and Packaging Program)

Another example of the bag forming and packaging program will now be described. Fig. 10 is a diagram showing parameters related to a bag forming and packaging program
10 which are recorded in the recording medium 110 of the film roll 100 and the computer 1 of the vertical pillow type bag forming and packaging apparatus 300.

[0118]

Fig. 10 (a) shows a film identification number No.
15 (film identification number) and a fabrication condition which are parameters related to the bag forming and packaging program recorded in the recording medium 110, and Fig. 10 (b) shows packaging conditions among the parameters related to the bag forming and packaging program recorded beforehand in
20 the computer 1 of the vertical pillow type bag forming and packaging apparatus 300.

[0119]

The film identification NO. recorded in the recording medium 110 shown in Fig. 10 (a) is associated with the
25 fabrication condition at the time of fabrication to be

recorded. This film identification NO. is assigned to each film roll 100.

[0120]

The operator finds packaging conditions of the vertical pillow type bag forming and packaging apparatus 300 beforehand using the film roll 100 for each fabrication condition, to store the packaging conditions for the film roll 100 of each fabrication condition into the ROM (Read Only Memory) 502 in the computer 1 of the vertical pillow type bag forming and packaging apparatus 300.

[0121]

Another example of the bag forming and packaging program will subsequently be described.

Fig. 11 is a flowchart showing the operation of the computer 1 of the vertical pillow type bag forming and packaging apparatus 300 in the bag forming and packaging unit 12, using the film roll 100 shown in Fig. 10.

[0122]

The operation of the computer 1 shown in Fig. 11 differs from that shown in Fig. 9 as follows.

[0123]

As shown in Fig. 11, the computer 1 of the vertical pillow type bag forming and packaging apparatus 300 instructs the recording medium reading device 302 provided in the rotator 303 to read the film identification No. recorded in

the recording medium 110 of the film roll 100 (Step S12a).
[0124]

The computer 1 associates the read film identification NO. with packaging conditions having the corresponding film identification NO. (Step S12b). In other words, the computer 1 of the vertical pillow type bag forming and packaging apparatus 300 compares a plurality of film identification NOs. in the packaging conditions recorded beforehand and the read film identification NO., thereby selecting the corresponding packaging conditions to associate them with each other. Where the film identification NO. "5", for example, is recorded in the recording medium 110 shown in Fig. 10, the computer 1 associates it with the packaging conditions having the film NO. "5" recorded beforehand in the vertical pillow type bag forming and packaging apparatus 300.
[0125]

The computer 1 makes the setting of the vertical pillow type bag forming and packaging apparatus 300 based on the packaging conditions included in the parameters related to the bag forming and packaging program (Step S13).
[0126]

As described above, since in this embodiment the film roll identifier is recorded in the recording medium 110 attached on each film roll 100, optimum packaging conditions which are associated beforehand with the film roll identifier

can be set in a short time at the time of exchange of film rolls 100, regardless of the skill of the operator. This prevents an unskilled operator from setting erroneous packaging conditions and producing additional time loss and
5 film loss.

[0127]

Furthermore, in the above product handling system, the number of products produced (packaging number) by the operator operating the bag forming and packaging device,
10 rejected pieces, operating time and the like can be transmitted momentarily to the host computer from the CPU 500 via the input/output device 501. As a result, it is possible to prevent delay in communicating the product result or errors in recited information and the like, which enables the
15 manager to know the production result in real time.

[0128]

In this embodiment, the recording medium 110 corresponds to first storage means, the recording medium reading device 302 corresponds to reading means, the vertical
20 pillow type bag forming and packaging apparatus 300 corresponds to packaging means and a packaging machine, the RAM 503 and the external recording device 506 correspond to second storage means, the manufacturing unit 10 for pieces to be packaged, weighing unit 11, bag forming and packaging

unit 12, inspector 13, case packer 14, labeling unit 15, and belt conveyors 16, 17 correspond to a handling device.

[0129]

(Another Example of Bag Forming and Packaging Program)

5 Another example of the bag forming and packaging program will now be described. Fig. 12 is a diagram showing parameters related to a bag forming and packaging program recorded in the recording medium 110 of the film roll 100 and the computer 1 of the vertical pillow type bag forming and
10 packaging apparatus 300.

[0130]

Fig. 12 (a) shows a product identification number NO. (product identification number) and a fabrication condition which are parameters related to the bag forming and packaging
15 program recorded in the recording medium 110, and Fig. 12 (b) shows packaging conditions among parameters related to the bag forming and packaging program recorded beforehand in the computer 1 of the vertical pillow type bag forming and packaging apparatus 300.

20 [0131]

The product identification NO. recorded in the recording medium 110 shown in Fig. 12 (a) is associated with the fabrication condition at the time of fabrication to be recorded. This product identification NO. is assigned to
25 each product to be produced.

[0132]

The operator finds packaging conditions of the vertical pillow type bag forming and packaging apparatus 300 beforehand using the film roll 100 for each fabrication condition, to store the packaging conditions and the product reservation list for the film roll 100 of each fabrication condition into the ROM (Read Only Memory) 502 in the computer 1 of the vertical pillow type bag forming and packaging apparatus 300.

10 [0133]

Fig. 13 is a flowchart showing the operation of the computer 1 of the vertical pillow type bag forming and packaging apparatus 300, using the film roll 100 shown in Fig. 12. The operation of the computer 1 shown in Fig. 13 differs from that shown in Fig. 9 or Fig. 11 as follows.

[0134]

As shown in Fig. 13, the computer 1 of the vertical pillow type bag forming and packaging apparatus 300 instructs the recording medium reading device 302 provided in the rotator 303 to read the product identification NO. recorded in the recording medium 110 of the film roll 100 (Step S12c).

[0135]

The computer 1 associates the read product identification NO. with a product reservation list having the corresponding product identification NO. (Step S12d). Then,

the computer 1 associates the film identification NO. of the associated product reservation list with packaging conditions having the corresponding film identification NO. (Step S12e). In other words, the computer 1 of the vertical
5 pillow type bag forming and packaging apparatus 300 compares the read product identification NO. and product identification NOs. in a plurality of product reservation lists recorded beforehand, for selection of the corresponding product reservation list to associate them
10 with each other. Then, the computer 1 selects the packaging conditions having the film identification NO. corresponding to that included in the associated product reservation list to associate them with each other.

[0136]

15 When the product identification NO. "001", for example, is recorded in the recording medium 110 shown in Fig. 12, the computer 1 associates it with the product reservation list having the product identification NO. "001" from the product reservation lists recorded beforehand in the
20 vertical pillow type bag forming and packaging apparatus 300. The computer 1 subsequently associates the film identification NO. "5" of the product reservation list having the product identification NO. "001" with the packaging conditions of the film identification NO. "5" from the
25 packaging conditions recorded beforehand in the vertical

pillow type bag forming and packaging apparatus 300.

[0137]

The computer 1 makes the setting of the vertical pillow type bag forming and packaging apparatus 300 based on the
5 packaging conditions included in the parameters related to the bag forming and packaging program (Step S13).

[0138]

As described above, since in this embodiment the product identifier is stored in the recording medium 110
10 attached on each film roll 100, optimum packaging conditions associated beforehand with the product identifier can be set in a short time at the time of exchange of film rolls 100, regardless of the skill of the operator. This prevents an unskilled operator from setting erroneous packaging
15 conditions and producing additional time loss and film loss.

[0139]

Furthermore, in the above product handling system, the number of products produced (packaging number) by the operator operating the bag forming and packaging device,
20 rejected pieces, operating time and the like can be transmitted momentarily to the host computer from the CPU 500 via the input/output device 501. As a result, it is possible to prevent delay in communicating the product result or errors in recited information and the like, which enables the
25 manager to know the production result in real time.

[0140]

In this embodiment, the recording medium 110 corresponds to first storage means, the recording medium reading device 302 corresponds to reading means, the vertical pillow type bag forming and packaging apparatus 300 corresponds to packaging means and a packaging machine, the RAM 503 and the external recording device 506 correspond to second storage means, the manufacturing unit 10 for pieces to be packaged, weighing unit 11, bag forming and packaging unit 12, inspector 13, case packer 14, labeling unit 15, and belt conveyors 16, 17 correspond to a handling device.

[0141]

(Another Example of Bag Forming and Packaging Program)

Another example of the bag forming and packaging program will now be described. Fig. 14 is a diagram showing another example of parameters related to a bag forming and packaging program recorded in the recording medium 110 of the film roll 100. The parameters related to the bag forming and packaging program shown in Fig. 14 differ from those shown in Fig. 8 as follows.

[0142]

Fig. 14 (a) shows a product reservation list among the parameters related to the bag forming and packaging program recorded in the recording medium 110, Fig. 14 (b) shows packaging conditions among the parameters related to the bag

forming and packaging program recorded in the recording medium 110, and Fig. 14 (c) shows peripheral device instruction information including setting conditions for the peripheral devices recorded in the recording medium 110.

5 [0143]

As shown in Fig. 14 (c), the peripheral device instruction information recorded in the recording medium 110 include such information as weighing device information for the weighing apparatus 200 in the weighing unit 11, weight
10 check information for the weight checker 13a in the inspector 13, seal check information (not shown) for the seal checker 13a in the inspector 13, metal detection information (not shown) for the metal detector 13b in the inspector 13, X-ray inspection information (not shown) for the X-ray inspector
15 13c in the inspector 13, operation information (not shown) for the belt conveyors 16, 17, case packing information for the case packer 14, and labeling information for the labeling unit 15.

[0144]

20 Fig. 15 is a flowchart showing the operation of the computer 1 of the vertical pillow type bag forming and packaging apparatus 300, using the film roll 100 shown in Fig. 14. The operation of the computer 1 shown in Fig. 14 differs from that shown in Fig. 9 as follows.

25 [0145]

The computer 1 of the vertical pillow type bag forming and packaging apparatus 300 instructs the recording medium reading device 302 provided in the rotator 303 to read the parameters related to the bag forming and packaging program
5 and the peripheral device instruction information recorded in the recording medium 110 of the film roll 100 (Step S12f).
[0146]

The computer 1 transmits the read peripheral device instruction information to the peripheral devices (Step
10 S12g). The computer 1 subsequently extracts a product reservation list and packaging conditions included in the read parameters related to the bag forming and packaging program to make the setting of the vertical pillow type bag forming and packaging apparatus 300 based on the extracted
15 product reservation list and packaging conditions (Step S13).
[0147]

As described above, in this embodiment the operator is not required to input such setting conditions as the
20 weighing device information for one or more production devices such as the weighing apparatus 200 in the weighing unit 11 which produce products together with the bag forming and packaging machine. This prevents wasteful time losses due to errors in the setting conditions made by the operator
25 and the like.

[0148]

Moreover, since the record can be made of abnormality information on the bag forming and packaging device, the manager is able to grasp a trouble occurring situation, and
5 also to easily pursue the cause of a trouble.

[0149]

Furthermore, in the above product handling system, the number of products produced (packaging number) by the operator operating the bag forming and packaging device,
10 rejected pieces, operating time and the like can be transmitted momentarily to the host computer from the CPU 500 via the input/output device 501. As a result, it is possible to prevent delay in communicating the product result or errors in recited information and the like, which enables the
15 manager to know the production result in real time.

[0150]

In this embodiment, the recording medium 110 corresponds to first storage means, the recording medium reading device 302 corresponds to reading means, the vertical
20 pillow type bag forming and packaging apparatus 300 corresponds to packaging means and a packaging machine, the RAM 503 and the external recording device 506 correspond to second storage means, the manufacturing unit 10 for pieces to be packaged, weighing unit 11, bag forming and packaging

unit 12, inspector 13, case packer 14, labeling unit 15, and belt conveyors 16, 17 correspond to a handling device.

[0151]

[Effect of the Invention]

5 According to the present invention, since the packaging condition is stored in the first storage means affixed to the roll of packaging material, an optimum packaging condition can be set in a short time at the time of exchange of rolls of packaging material, regardless of the
10 operator's skill. This prevents even an unskilled operator from setting some erroneous packaging condition and producing additional time loss and packaging material loss.

[Brief Description of the Drawings]

[Fig. 1]

15 A schematic diagram of a product handling system comprising a bag forming and packaging machine according to an embodiment of the present invention.

[Fig. 2]

20 A block diagram showing an example of the product handling system of Fig. 1.

[Fig. 3]

 An elevation view showing the details of the belt conveyor, weighing unit, and bag forming and packaging unit of Fig. 1.

25 [Fig. 4]

A perspective view showing bag forming and packaging by the vertical pillow type bag forming and packaging apparatus.

[Fig. 5]

5 A diagram showing the details of the support shaft of the vertical pillow type bag forming and packaging apparatus and the film roll.

[Fig. 6]

A schematic diagram showing manufacturing steps of the
10 film roll.

[Fig. 7]

A block diagram showing the structure of the computer provided inside the vertical pillow type bag forming and packaging apparatus of the bag forming and packaging unit of
15 Fig. 1.

[Fig. 8]

A diagram showing an example of the parameters recorded in the recording medium of the film roll.

[Fig. 9]

20 A flowchart showing the operation of the computer of the vertical pillow type bag forming and packaging apparatus using the film roll shown in Fig. 7.

[Fig. 10]

A diagram showing parameters related to a bag forming
25 and packaging program recorded in the recording medium of the

film roll and the computer of the vertical pillow type bag forming and packaging apparatus.

[Fig. 11]

A flowchart showing the operation of the computer of
5 the vertical pillow type bag forming and packaging
apparatus in the bag forming and packaging unit, using the
film roll shown in Fig. 10.

[Fig. 12]

A diagram showing another example of parameters
10 related to a bag forming and packaging program recorded in
the recording medium of the film roll and the computer of the
vertical pillow type bag forming and packaging apparatus.

[Fig. 13]

A flowchart showing the operation of the computer of
15 the vertical pillow type bag forming and packaging apparatus,
using the film roll shown in Fig. 12.

[Fig. 14]

A diagram showing another example of parameters
related to a bag forming and packaging program recorded in
20 the recording medium of the film roll.

[Fig. 15]

A flowchart showing the operation of the computer of
the vertical pillow type bag forming and packaging apparatus,
using the film roll shown in Fig. 14.

25 [Description of Reference Numerals]

- 10: manufacturing unit for pieces to be packaged
- 11: weighing unit
- 12: bag forming and packaging unit
- 13: inspector
- 5 14: case packer
- 15: labeling unit
- 16, 17: belt conveyor
- 110: recording medium
- 302: recording medium reading device
- 10 300: vertical pillow type bag forming and packaging
apparatus
- 503: RAM
- 506: external storage device

F I G . 1

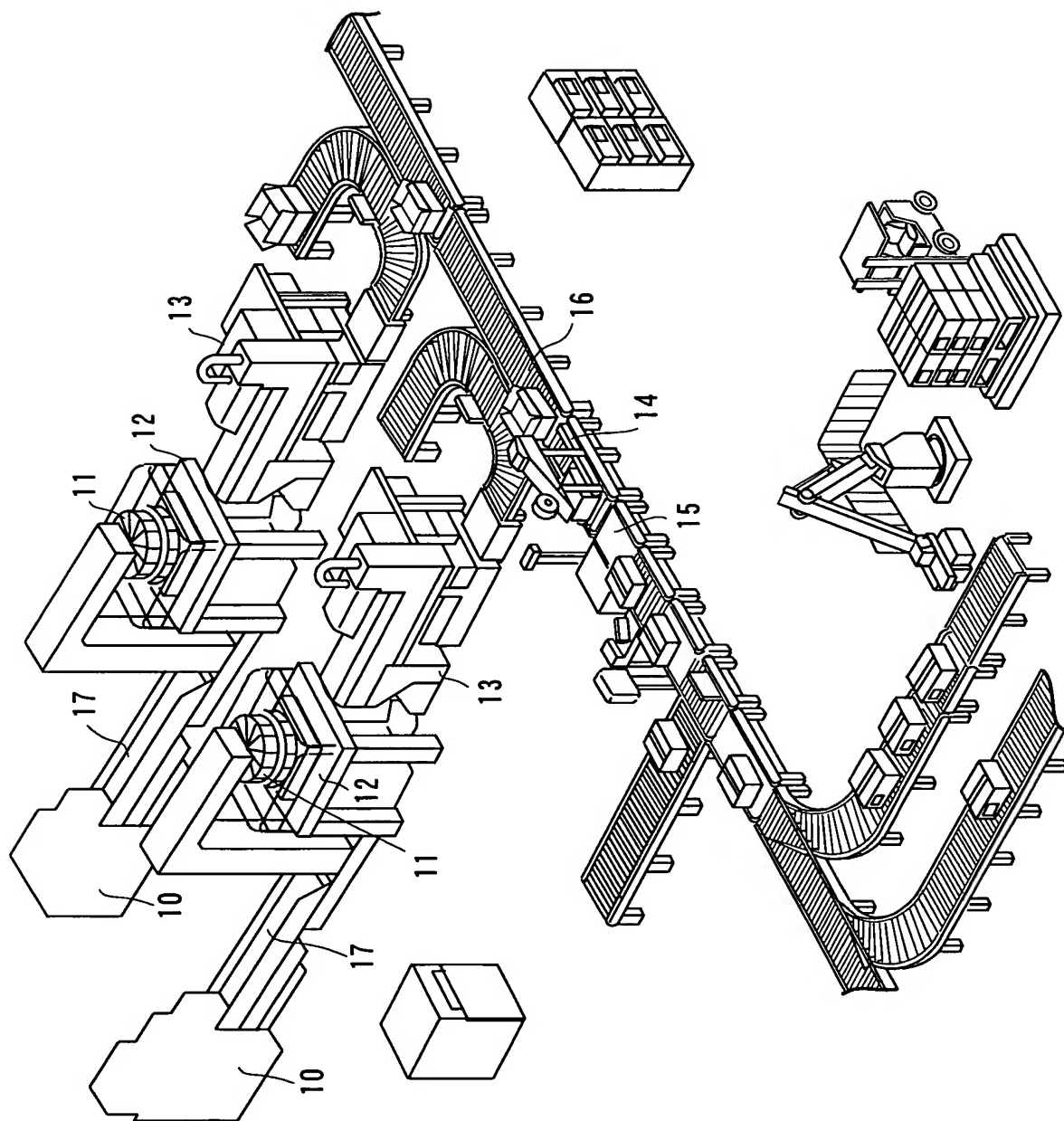


FIG. 2

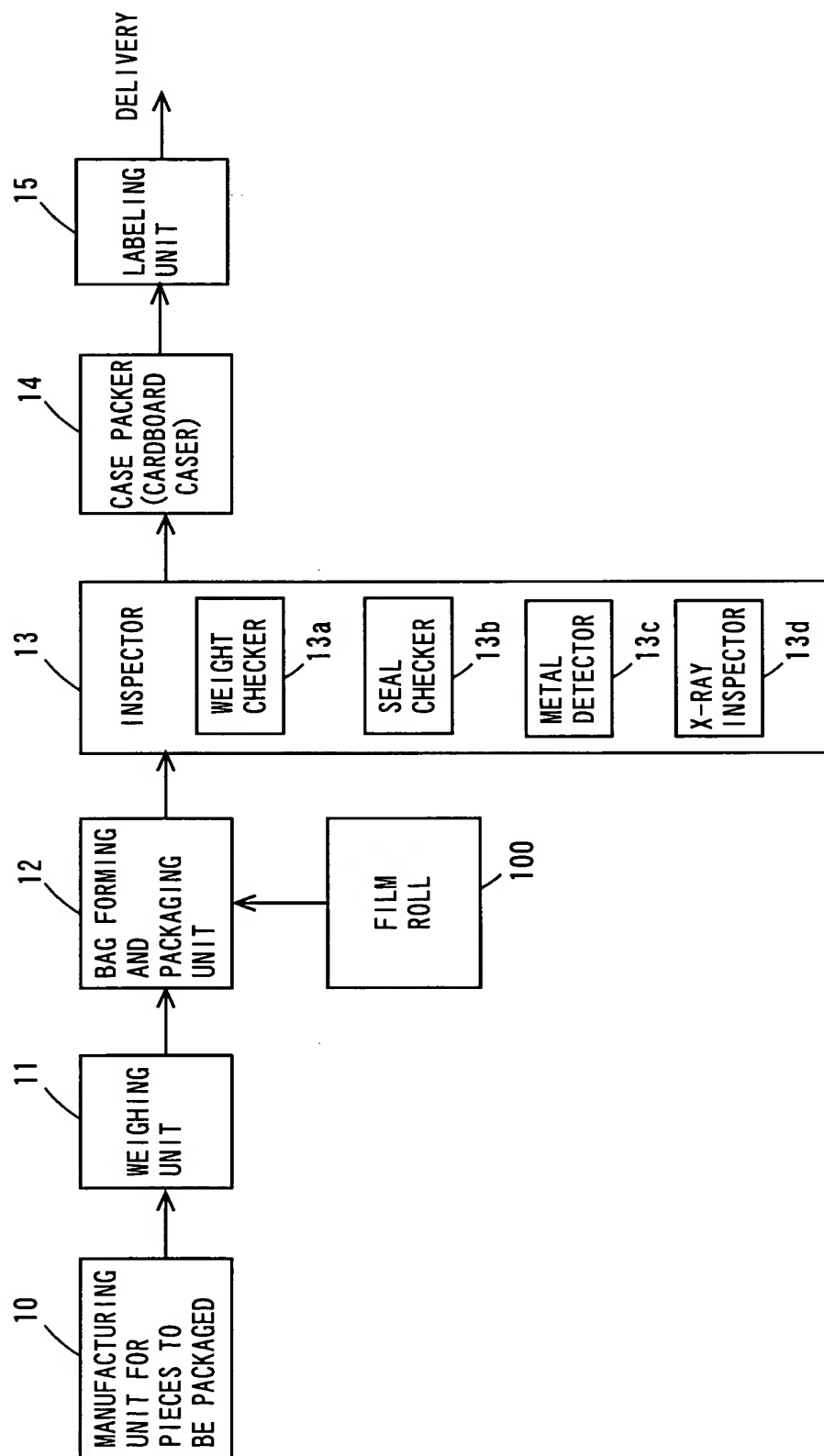
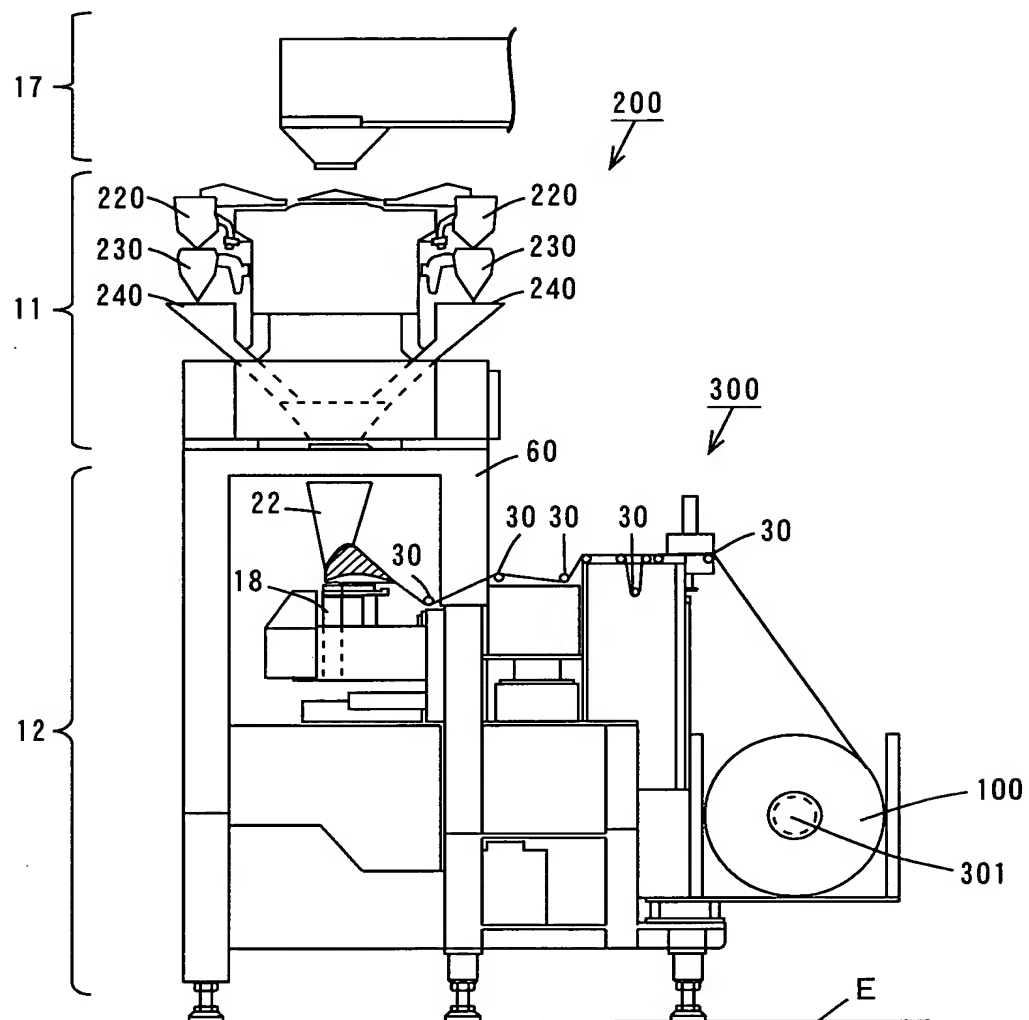


FIG. 3



F I G . 4

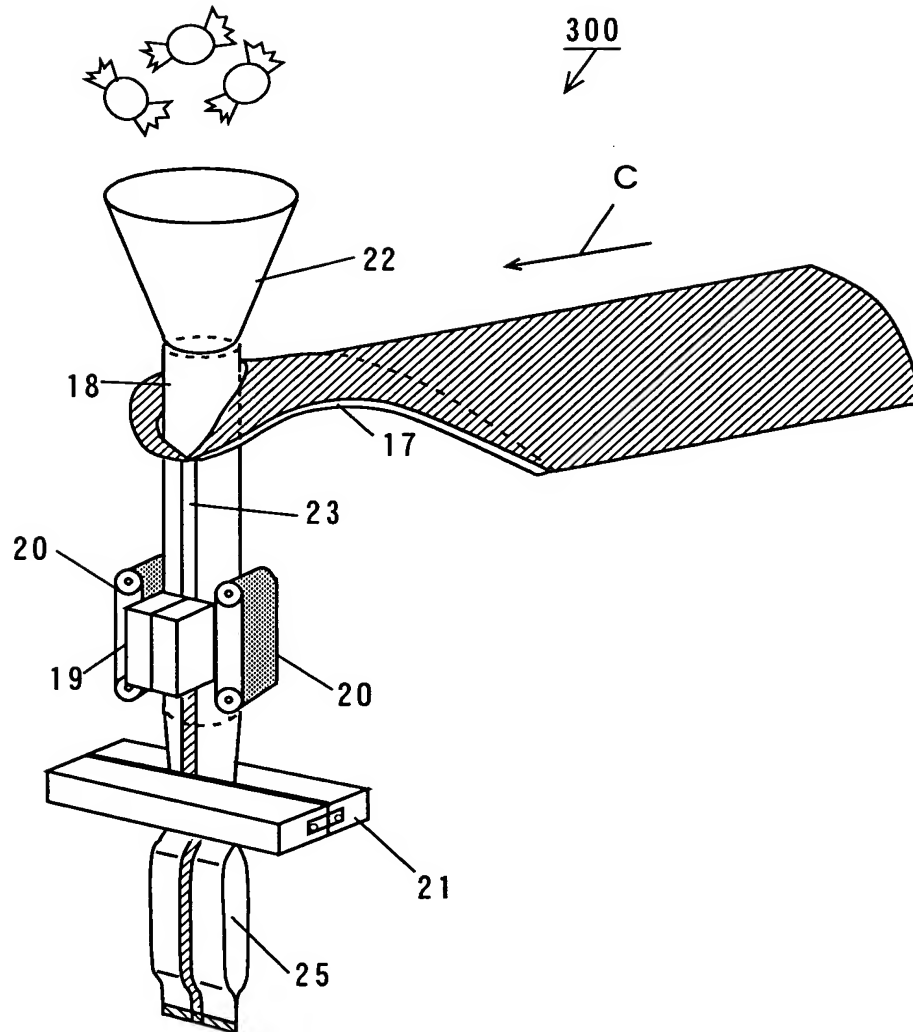


FIG. 5

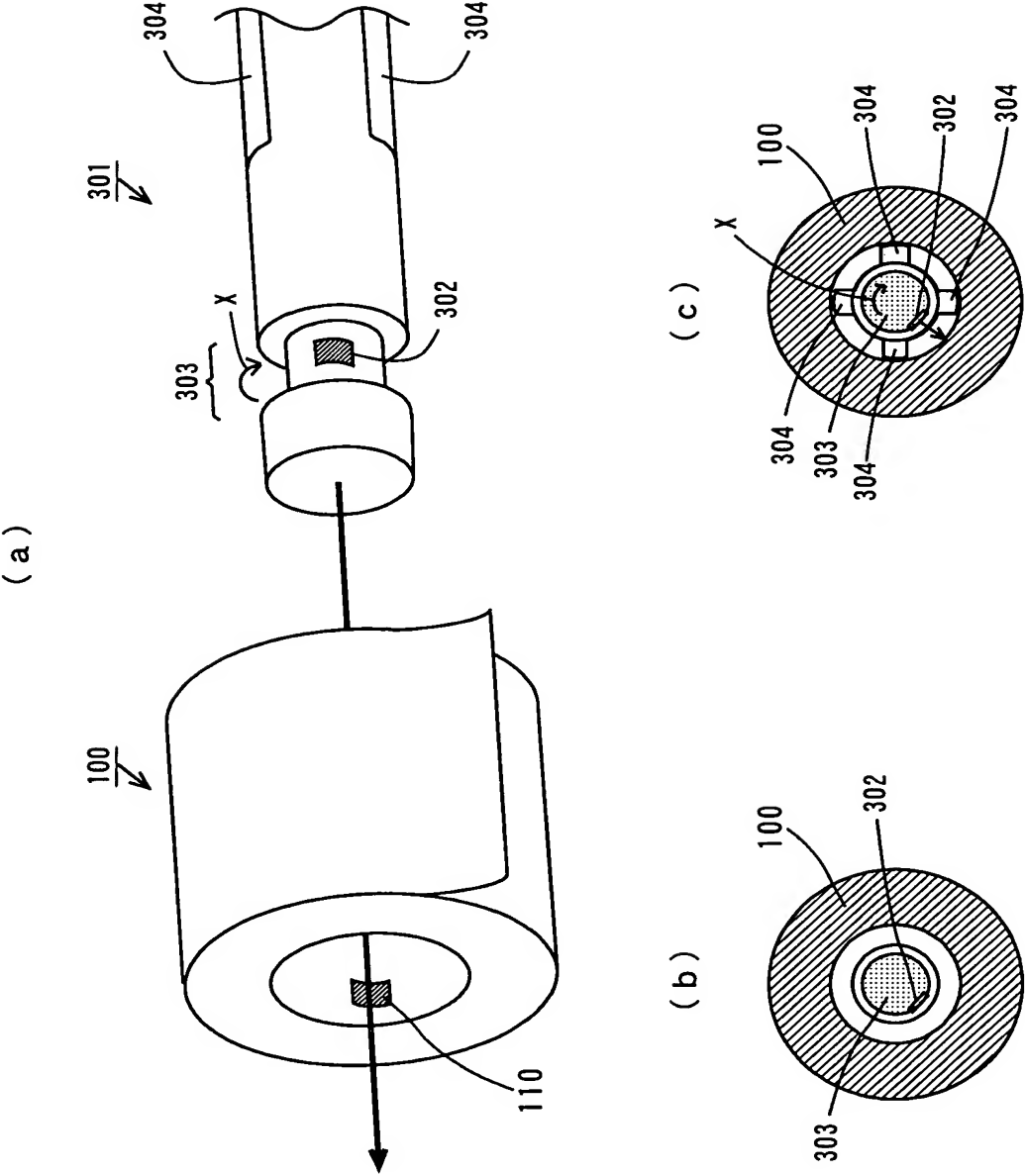


FIG. 6

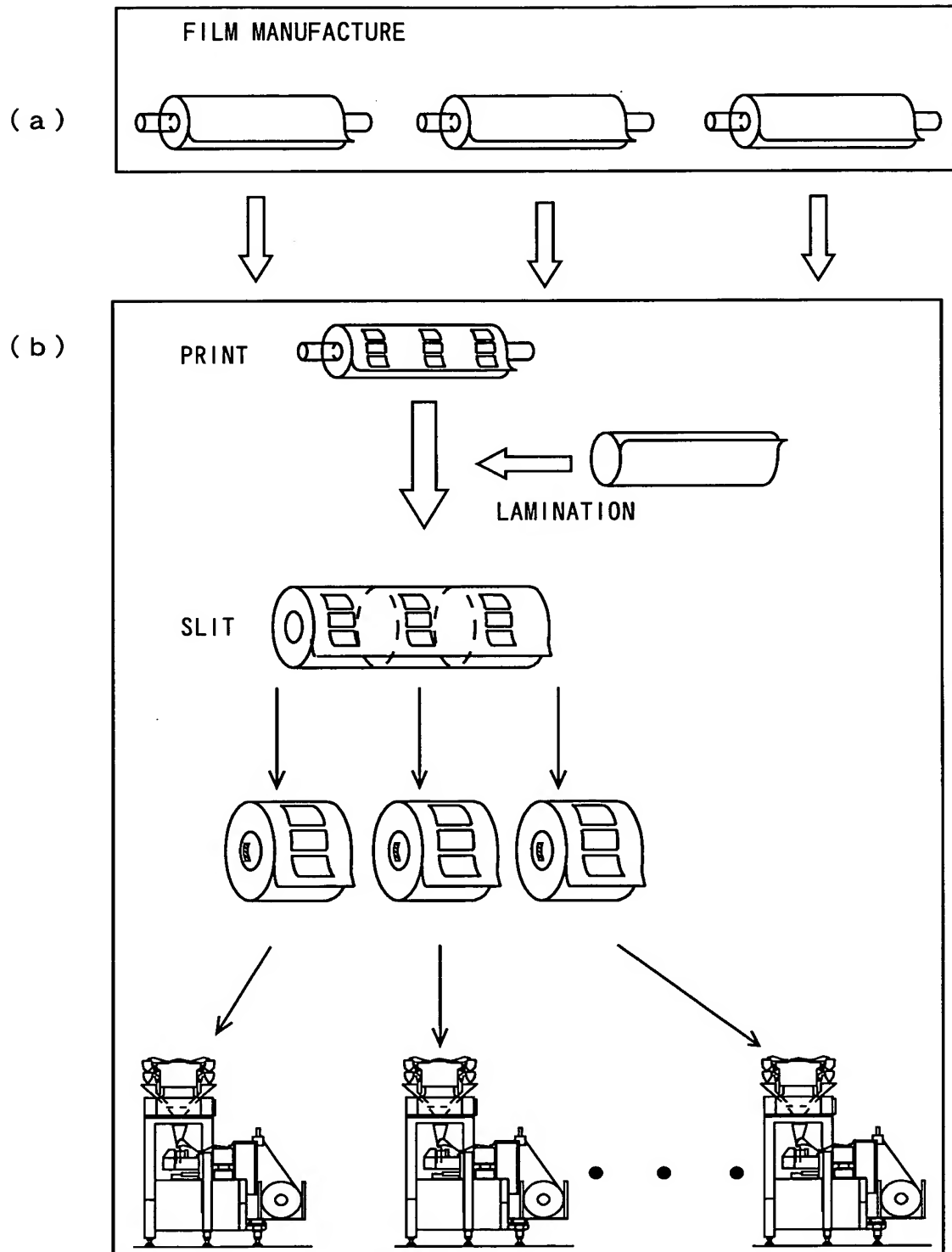


FIG. 7

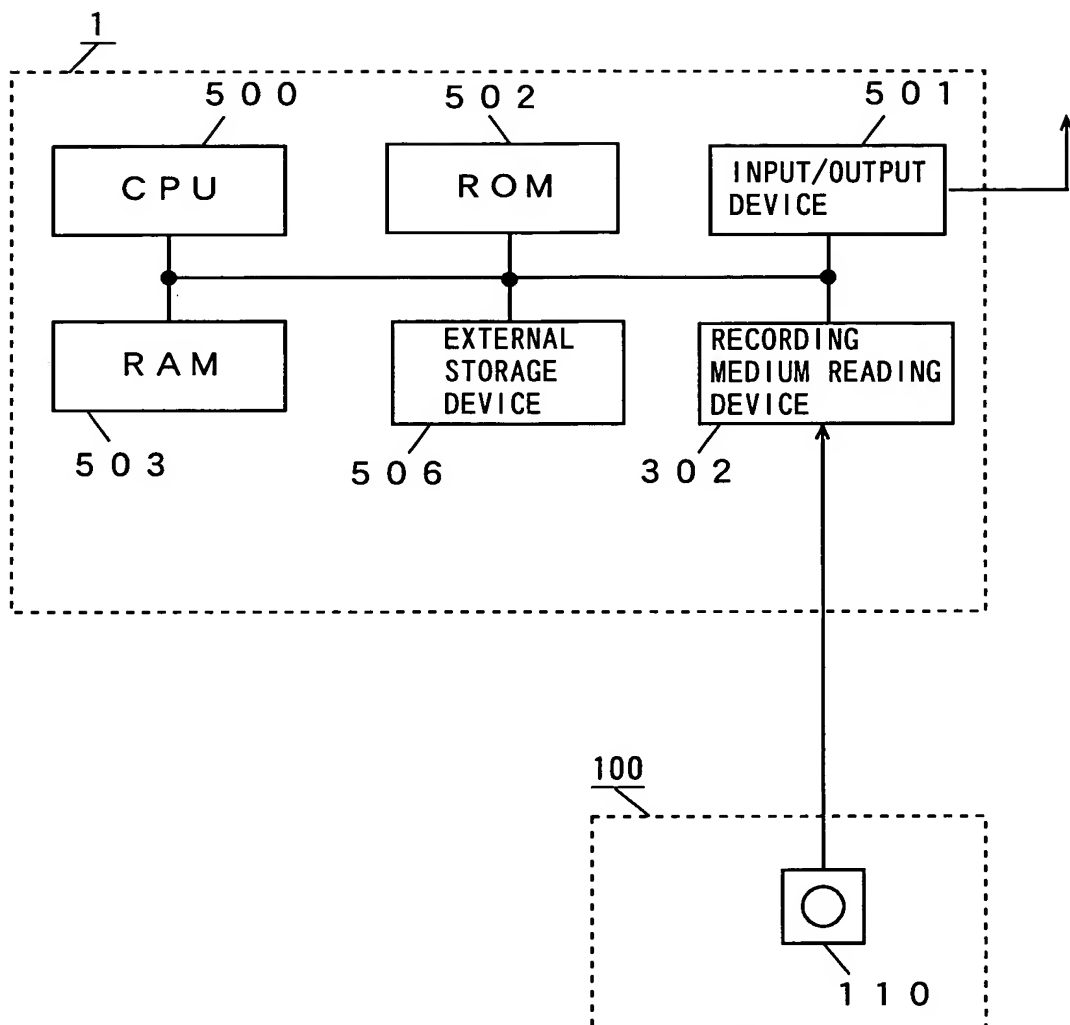


FIG. 8

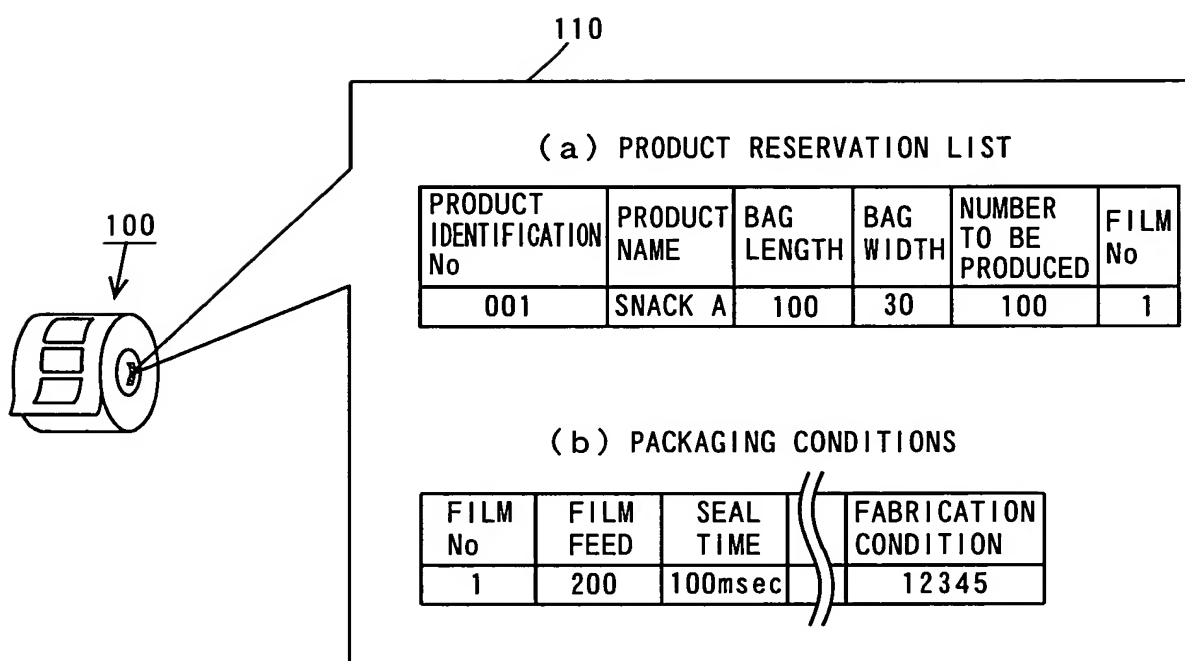


FIG. 9

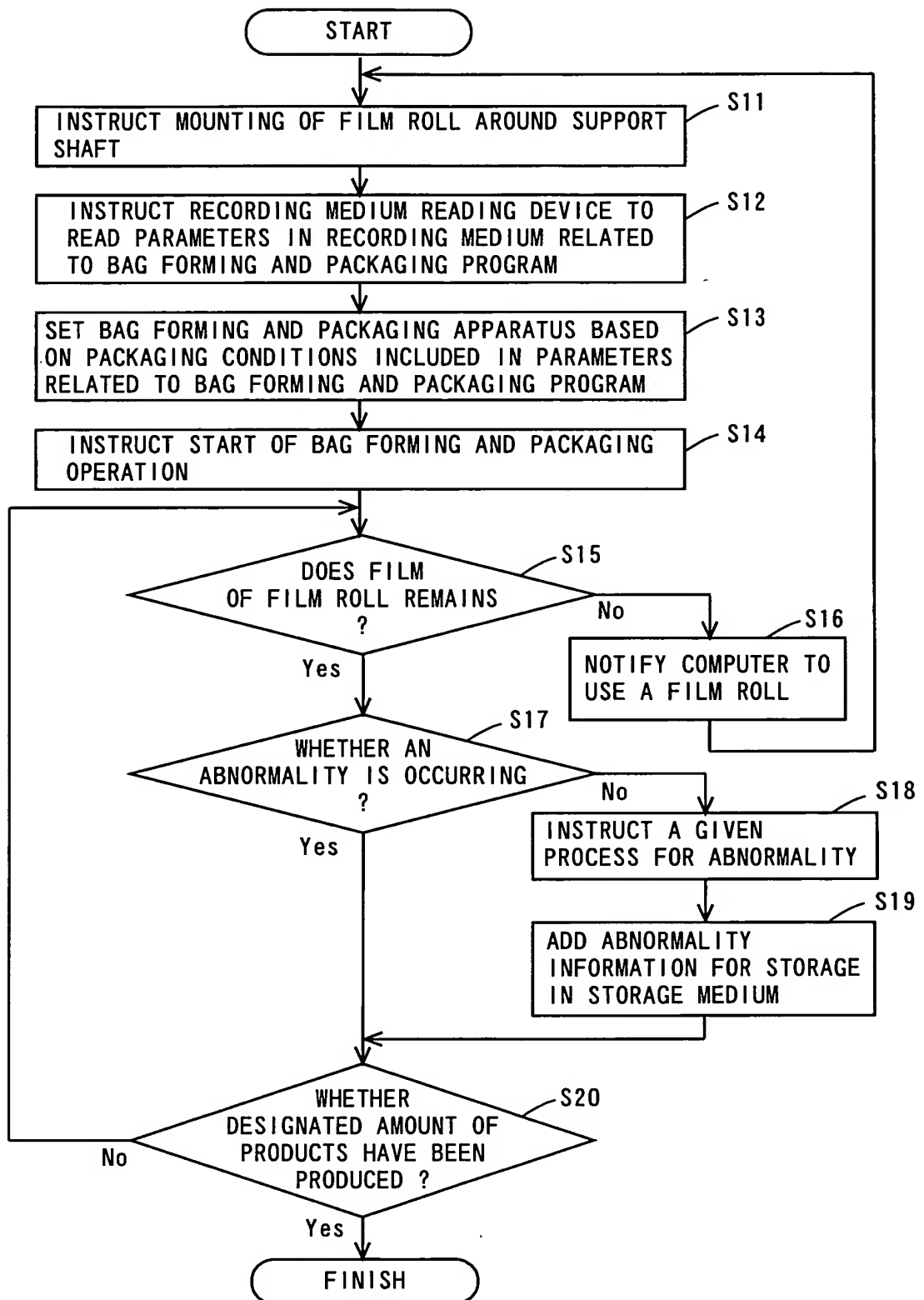


FIG. 10

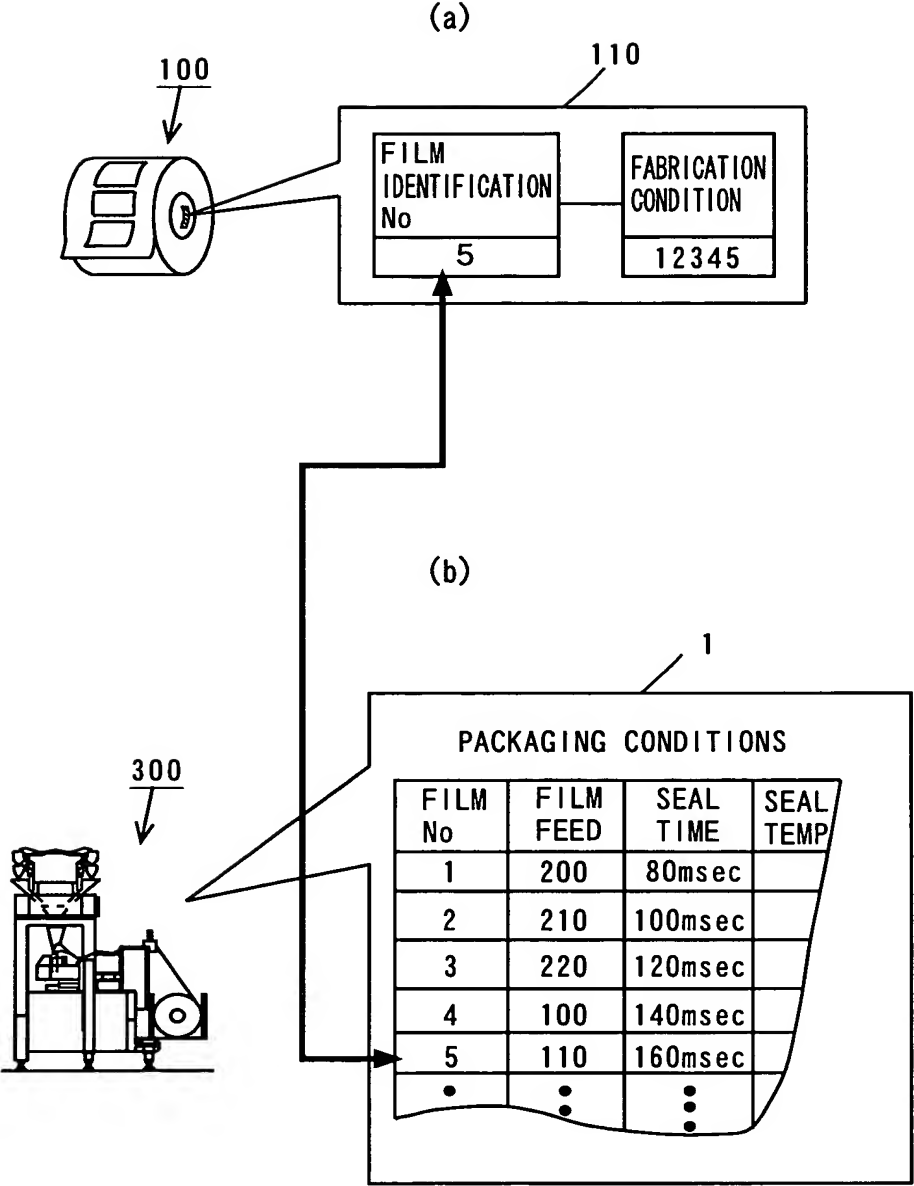


FIG. 11

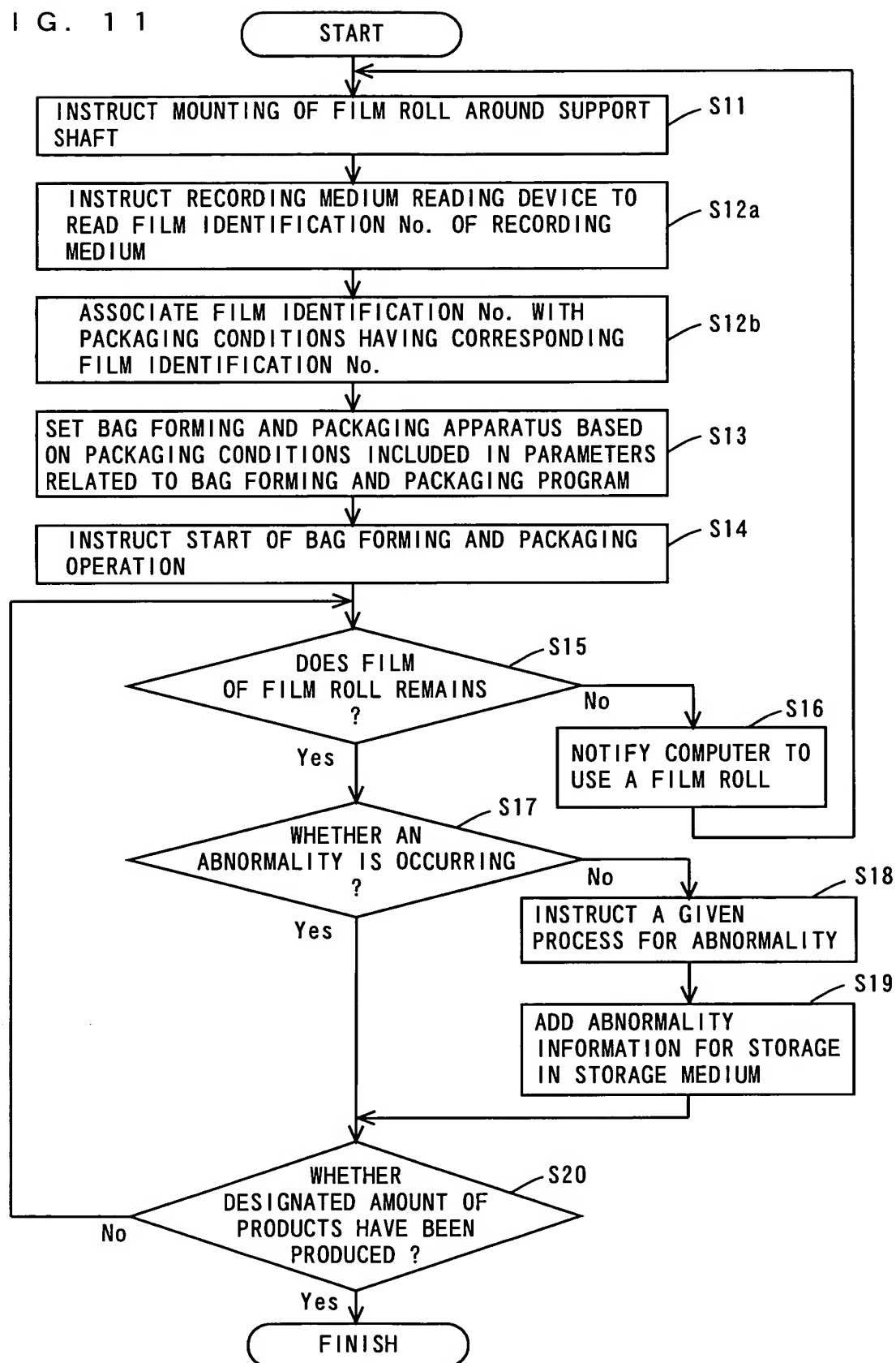


FIG. 12

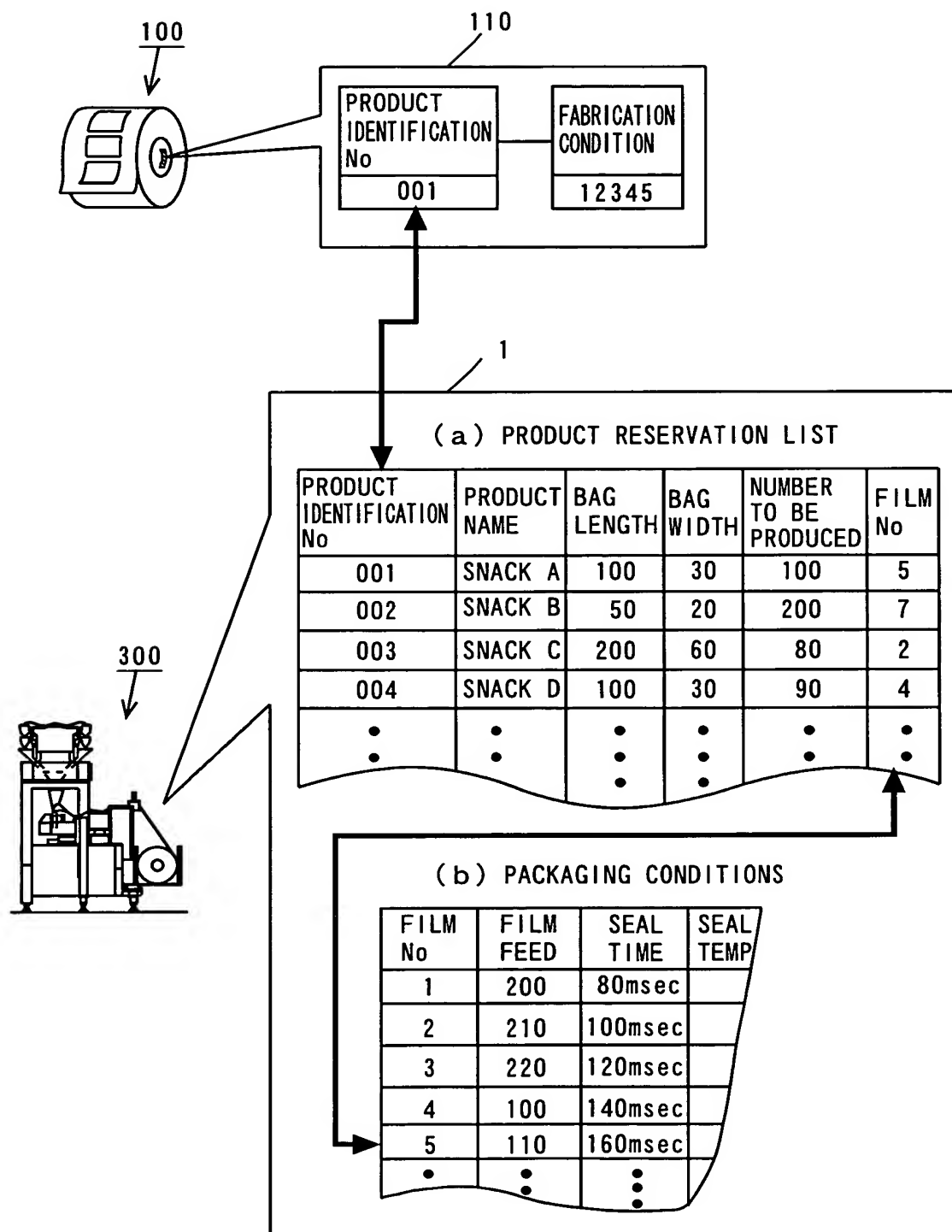


FIG. 13

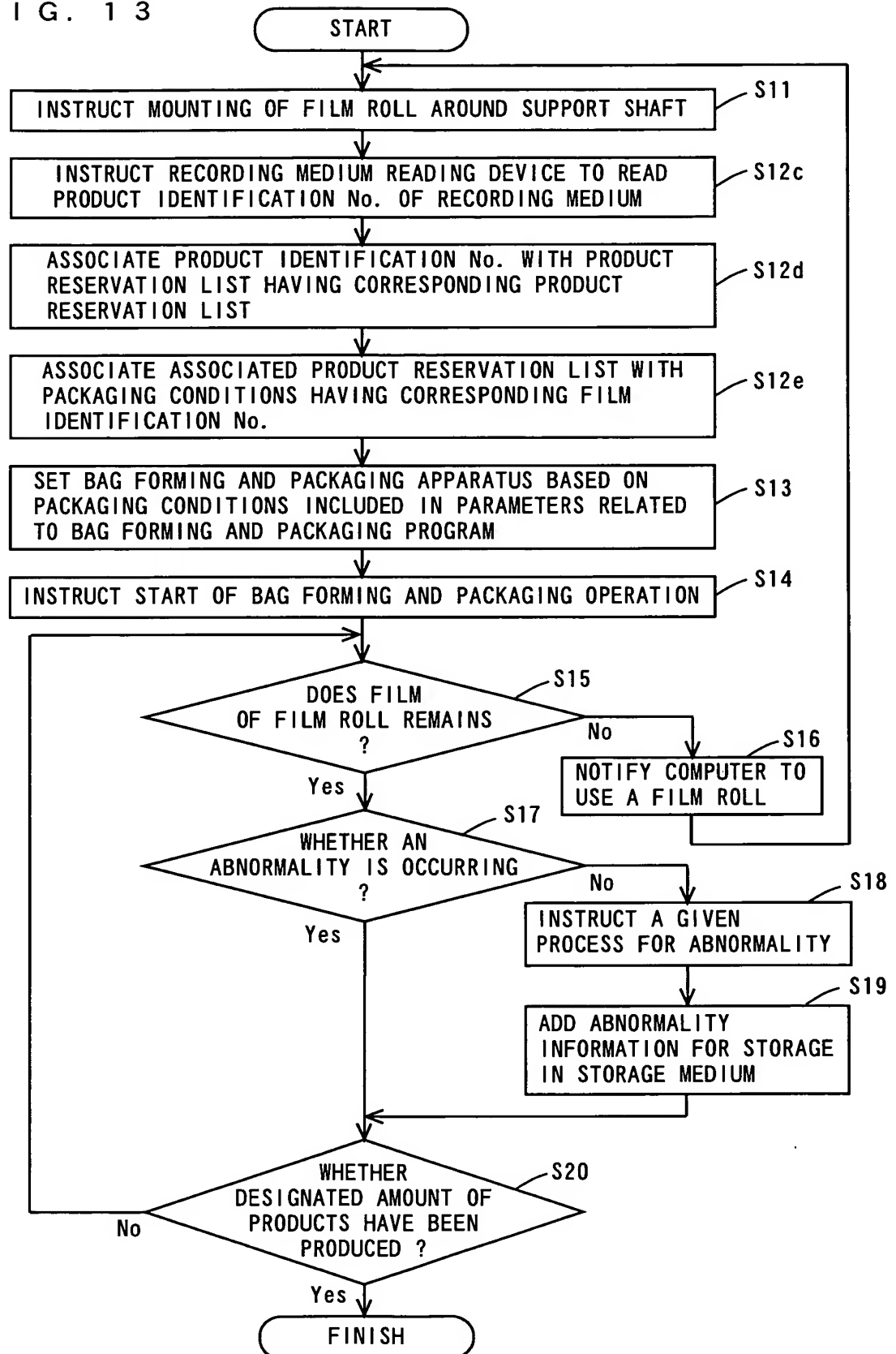


FIG. 14

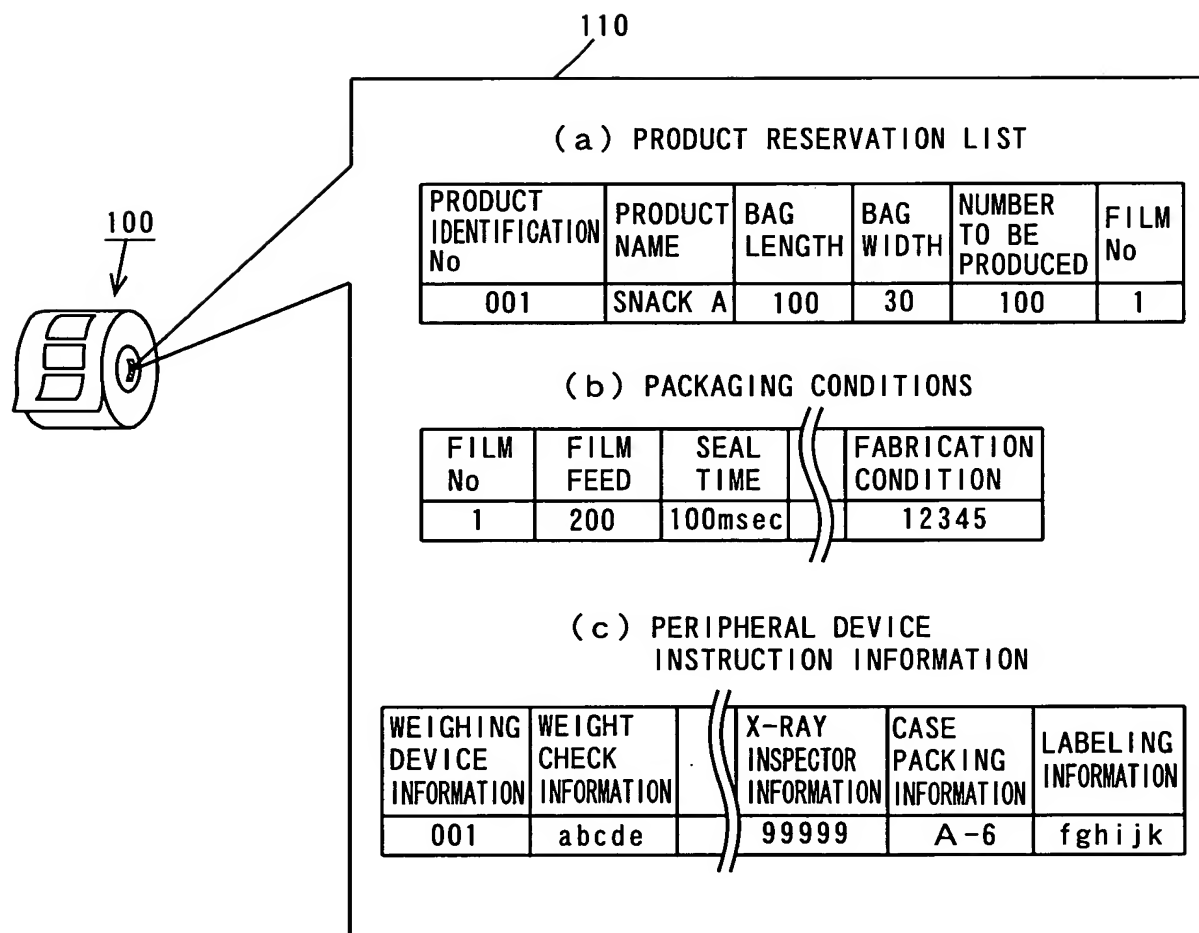
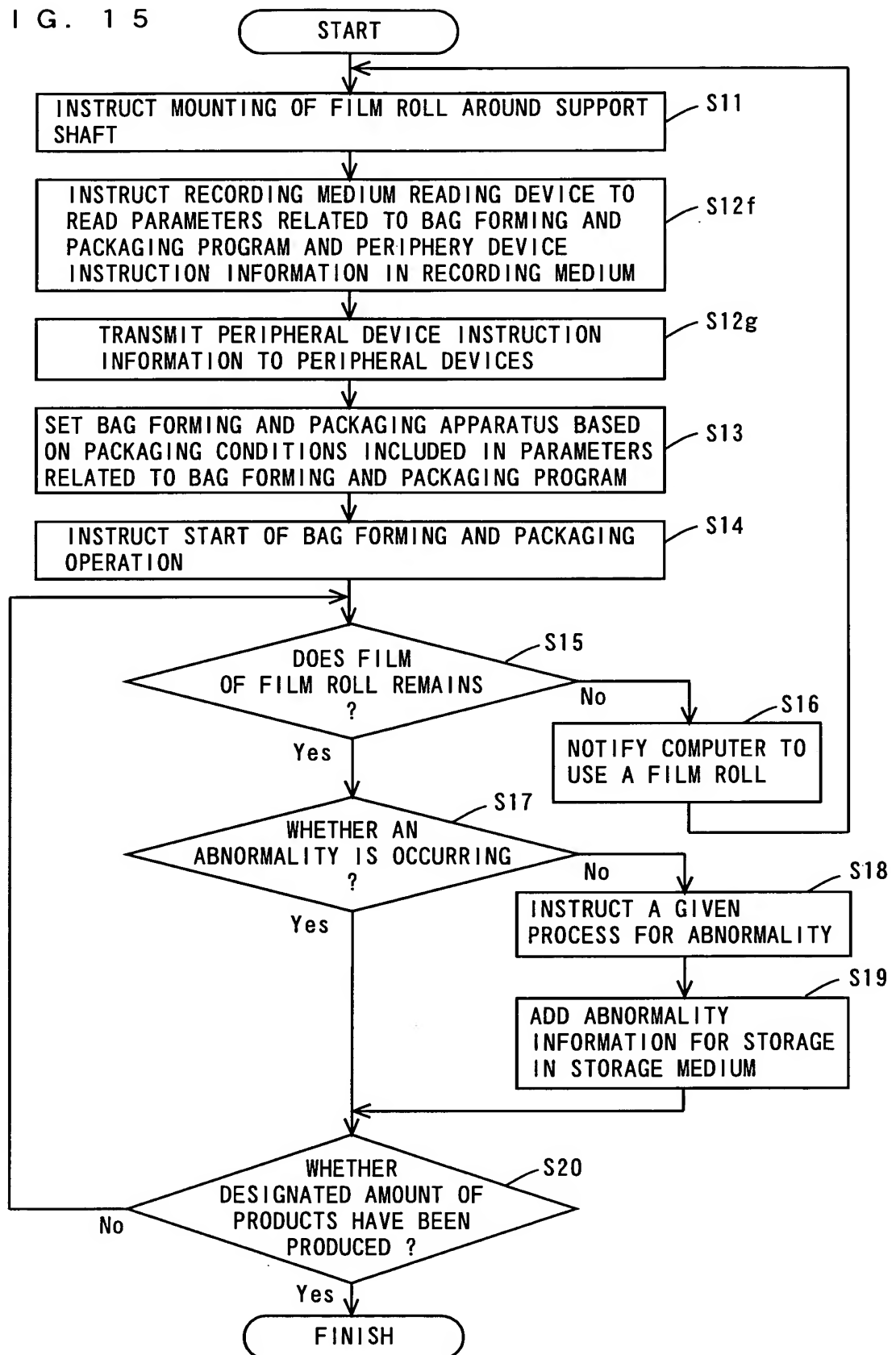


FIG. 15





[Document Name] Abstract

[Abstract]

[Subject] Providing a roll of packaging material with which the shortening of downtime is easily achieved, and real-time
5 production management can be made, and providing a packaging machine using such a roll of packaging material and a product handling system using such a packaging machine.

[Solving Means] A packaging condition for packaging a product by using a film roll 100 is stored in a recording
10 medium 110, and the packaging condition is read by a recording medium reading device 302 on a rotator 303 of a support shaft 301. In this case, an optimum packaging condition can be set in a short time at the time of exchange of rolls of packaging material, regardless of the operator's skill. This prevents
15 even an unskilled operator from setting erroneous packaging conditions and producing additional time loss and a film loss

[Selected Drawing] Fig. 5